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ABSTRACT

To determine whether students have study strategies that they can transfer to future learning tasks, a research study used a content-based model--the Supportive Seminar--a voluntary content review session held by a leader enrolled in a targeted college course for freshmen. The leader acts as a role model for the students by attending all lectures, reading all assignments, taking all tests, and utilizing the appropriate study strategies. The goal of the Supportive Seminar is to teach the students effective study strategies that can be regulated for a specified course and then transferred to future courses. The seminar also assisted college students in learning effective study strategies while learning new content area concepts. Pre- and post-study strategy assessments indicated that the seminar can teach college students how to employ and regulate effective and appropriate study strategies, and that the seminar can help students plan, monitor, and evaluate their own independent learning. Students' reports 5 months after the seminar indicated that they transferred the appropriate strategies, regularly used many of the strategies learned in the seminar, were aware of the underlying processes and the uniqueness of each strategy, and would highly recommend a Supportive Seminar to a friend. This seminar concept has a more positive image than does the traditional skills model. Furthermore, Supportive Seminars are credible delivery models that adhere to a content-based philosophy of college reading. A 12-item list of references and 4 data tables are appended. (SRT)

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Teaching University Freshmen to Employ, Regulate, and Transfer Study Strategies to the Content Areas

Michele L. Simpson

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Teaching university freshmen to employ, regulate, and transfer study strategies to the content areas

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Recent research has suggested that college students' difficulties with independent learning are not due to a lack of knowledge or awareness of possible study strategies, but instead are due to their inabilities to regulate the strategies (Nist, Hogrebe, & Simpson, in press; Tierney, 1982). Strategy regulations are those metacognitive activities that successful learners use to plan activities prior to undertaking a task, to monitor activities during the learning task, and to check and evaluate outcomes in terms of efficiency and effectiveness once the task is completed (Brown, Bransford, Ferrara, & Campione, 1982). This research has also suggested that content-based program models have a better chance of insuring that students will transfer the strategies to their future learning with some amount of regulation. (Nist, Hogrebe, & Simpson, in press). Hence, the primary focus of college reading programs should logically be upon the provision of realistic tasks which provoke the students into applying the strategies so that they are required to plan, monitor, and evaluate their own learning.

Though most college reading programs which teach study strategies have not fully addressed this issue, one content-based model, Supplemental Instruction, (Martin & Blanc, 1981) has attempted to provide the realistic learning tasks by holding adjunct study strategy sessions for specific college courses. Martin and Blanc's model has primarily emphasized student academic performance and retention. The results of their studies have consistently found that the retention and academic performance of their students were significantly improved. However, Martin and Blanc's research has not investigated whether their students had the regulatory control over the strategies that would permit them to transfer the strategies to future learning tasks. Thus, the purpose of this research study was to answer that question using a content-based model similar to Martin and Blanc's. A program evaluation design with a quasi-experimental approach was developed to answer these four questions:

1) Will there be a difference in the quantity and kind of the recommended strategies between the participants and the non-participants?
2) Will the final grades of the participants differ from the non-participants?
3) What strategies, if any, will participants report to utilize during the next semester of college?
4) How will the participants evaluate the impact of the Supportive Seminar?

METHOD

Supportive Seminar Concept

The content-based approach that was implemented in order to answer the four research questions was labeled the Supportive Seminar. The researcher defined the Supportive Seminar to be a voluntary and adjunct process and content review session held by a leader who is presently enrolled in a targeted college course for freshmen. The leader acts as a role model for the students by attending all lectures, reading all assignments, taking all tests, and utilizing the appropriate study strategies. The primary

goal of the Supportive Seminar is to teach the students a repertoire of effective study strategies that they can regulate within the tasks of a specified course. A secondary goal is to help the students successfully transfer the appropriate strategies to future college courses. There were several basic assumptions that characterized the Supportive Seminar's implementation in this study:

1) There is no best way to study, no generic approach to successful independent learning.
2) Students can learn how to regulate strategies when proper instruction with realistic tasks is provided.
3) Students are motivated to learn strategies when taught in immediate and real contexts.
4) Students can learn how to integrate content with process when role models are provided.

Each of the sessions followed a typical three-part format. The Supportive Seminar Sessions always opened with student questions over lectures or assigned readings. During the second part, about twenty minutes in length, the leader taught the appropriate study strategies. These strategies were selected by the leader (the leader was the researcher in this study) after she had discussed with the professor the goals of each unit of study and the specific types of test questions he asked. The following strategies were introduced to the students via example and or modeling, discussed, practiced, and reinforced in various ways during the entire semester:

1) **The Cornell Lecture Note System**
   The students and leader took class notes on two thirds of their paper and reserved the other one-third of the notebook paper for questions which they composed over the lecture. The actual writing of the questions took place after the lecture on the students' and leader's own time. The students and leader also wrote a two to three sentence summary at the end of their lecture notes which would capsulize the lecture's key ideas. During the next seminar the students and leader would share their written questions and answers, as well as their summaries.
2) **The Survey Procedure**
   The students and leader applied the first step of the SQ3R procedure (Robinson, 1946) in order to create some expectation and sense of organization of what would be discussed in the chapter. After surveying, they answered these two questions: a) The chapter is about . . . (b) The key terms that I will have to understand once I have read the chapter are . . .
3) **Textbook Annotation**
   The students and leader selectively underlined key ideas, wrote brief statements summarizing key ideas in the textbook's margin, enumerated key ideas, and noted with a question mark the parts of the text that they did not understand. All of these annotations were monitoring strategies for the students' understanding or lack of understanding of the chapter's key ideas.
4) **Concept Cards for Key Terminology**
   From the survey and textbook annotation the students and leader selected key vocabulary and placed each term on an index card. On the back of the card they wrote the definition of the term and provided several examples and applications. These concept cards served as test rehearsal strategies for the students so they could check and test what they knew.

5) **Mapping**
The students and leader mapped (Pearson & Johnson, 1978) the assigned chapters in order to visually display the relationships between key ideas. Maps are non-linear outlines that encourage students to see how the entire chapter fits together. These maps were used as test rehearsal strategies as well as comprehension checking devices.

6) **Test-Taking Skills**
The students and leader discussed and practiced the principles of effective test taking (i. e. the art of taking a multiple choice exam with distractors such as "all the above" or "none of the above").

7) **Methods for Diagnosing Error Patterns**
The students and leader made appointments with the course's professor so they could go over each examination in order to learn why they missed the items that they did. They were encouraged to ask these questions while they went through the exam:
a) Why did I miss the question? Did I misread or misunderstand the question? Or did I not know the information?
b) If I didn't know the information, where did it come from? My lecture notes? The assigned reading? Handouts? Films?
c) If I misread the question, why?
d) What will I do differently next time?

For the third part of the Supportive Seminar the participants were required to share a ten-point short answer quiz that they wrote over the past week's lecture or assigned readings. The students worked in pairs by taking each other's quizzes and correcting them. The leader modeled the type of thinking that the professor required on the exam with her own quiz which she also shared with the students.

Subjects

The subjects of the study were 161 university freshmen enrolled in a general education elective entitled Introduction to Psychology. All the students and the professor were provided a handout during the first week of class that outlined the Supportive Seminar concept and listed the responsibilities of the Supportive Seminar leader and participants. The students who chose to attend at least three of the regularly scheduled Supportive Seminar Sessions (there were 16) during the semester were labeled the SS participants, while those students who chose not to attend any of the sessions became the non-participants. Data were collected on the second day of class that allowed the researcher to characterize and describe the two groups to insure their comparability. This data gathering process will be described later. The research from Martin and Blanc (1981) also assured the researcher that the SS participants were similar to the non-participants. They found from their analyses that "neither the extremely able nor the extremely weak were attracted to SI (Supplemental Instruction) in numbers disproportionate to their representation in class" (p. 21).

Data Collection Procedures

In order to answer research question one, a study strategy assessment was developed for the pre and post-measure. Within a realistically defined context, the researcher wanted to characterize the subjects in two ways at the beginning and end of the semester: 1) the quantity and kind of strategies reported and recommended for reading textbooks, learning from lectures, and for preparing for multiple choice and essay exams, and 2) the strategies recommended and reported for checking and evaluating learning (i.e. self-regulation). The assessment was developed and piloted upon 50 university freshmen who were enrolled in a non-credit study strategies class. The final

version, as it appears in Figure 1, was then administered to three university professors of reading who were asked to complete the questionnaire by listing all the possible strategies that they would consider exemplary and effective. A strategy was defined as a deliberate and planned activity or routine introduced into the service of learning or problem solving (Brown, Bransford, Ferrara, & Campione, 1982). The researcher had determined that if a strategy was mentioned by two of the three professors, it would be one of the model strategies that the subjects' answers would be compared against. For example, if two of the three professors had listed self-questioning as a strategy for test preparation, then self-questioning would have been designated as one of the model strategies for the comparison.

The psychology professor agreed to give each student who accurately completed the pre and post-assessment one-half credit of participation for a research experiment, a requirement of the course. Time was given to the researcher during the second class meeting and during the last week of classes and the professor requested at both sessions that the students complete the questionnaire as completely and honestly as possible.

At the semester's midterm when the participants and non-participants were fully established, the responses of the 161 students were tallied. The 46 students who had attended three Supportive Seminar Sessions were classified as SS participants and the 95 students who elected not to attend any of the Supportive Seminar Sessions were classified as non-participants. The 20 students who had attended one or two sessions were dropped from the analysis.

The data from the pre-assessment instrument revealed that the SS participants and the non-participants were highly similar in regards to the quantity and kind of self-reported strategies (see Table 1). Both the SS participants and non-participants had great difficulty recommending more than one criteria strategy for any of the described tasks, and with the situation of preparing for a psychology test, could barely recommend even one criteria strategy. It should also be noted that none of the SS participants and non-participants who reported one or more strategies for textbook study or exam preparation specifically addressed their recommendations to the designated psychology text or the designated task, a multiple choice exam with essay questions. Instead, their recommendations reflected an almost implicit assumption that there is a generic study system for any task or text in any content area.

Thus, the data collected from these four questions on the study strategy pre-assessment assured the researcher that the 46 students who participated in the Supportive Seminar and the 95 students who did not participate were comparable in terms of their abilities to recommend appropriate study strategies given a specified task. The study strategy post-assessment which would be administered at the end of the semester would measure the changes, if any, in the two groups.

In order to answer question two, the final grades of the students enrolled in Introduction to Psychology were released to the researcher with prior permission from the students. The data for the question three and four were collected five months later via a questionnaire which was sent to all of the SS participants at their residence halls or homes.

RESULTS AND DISCUSSION

Quantity and Kind of Strategies

The first research question asked whether there would be a difference between the SS participants and non-participants in regards to the quantity and kind of study strategies recommended on the study strategy post-assessment instrument. The data from the pre-assessment had indicated

that there were no significant differences between the two groups in August of the fall semester. The data on the post-assessment administered in December indicated that there were several differences between the SS participants and non-participants. Each of the four questions on the assessment instrument will be examined in order to describe these differences in more detail.

Reading a textbook. On the post-assessment the SS participants were able to recommend more strategies for reading and studying a difficult psychology assignment than the non-participants (See Table 2). Even though both groups improved considerably since August in their abilities to recommend criteria strategies, 28% of the non-participants were able to recommend more than one strategy in contrast to 70% of the SS participants.

On the pre-assessment both groups tended to favor the same textbook reading strategies of taking notes and underlining. On the post-assessment both groups again favored the criteria strategy of taking notes; however, the SS participants more consistently defined notetaking as a strategy of putting key ideas in your own words. This finding would not be surprising considering that the textbook annotation strategy taught in the Supportive Seminars emphasized that very same orientation.

Another important difference between the groups occurred with the criteria strategy of key term and concept reconstruction. On the pre-assessment, one SS participant and none of the non-participants recommended key concept reconstruction as a textbook study strategy. However, on the post-assessment, 46% SS participants recommended it as a strategy, while only eight percent of the non-participants recommended it. Again, the concept card strategy which was emphasized in the Supportive Seminar was probably a contributing factor to this large discrepancy between the groups.

Thus the 46 subjects who participated in the Supportive Seminar appeared to have more back-up strategies for understanding a difficult textbook assignment and were more likely to select strategies pertinent to the specific task of studying a difficult psychology chapter.

Learning from lectures. On the pre-assessment both groups had difficulty recommending criteria strategies for studying lecture notes. This finding was not surprising since most high school students have not had exposure to teachers who routinely present information not already covered in a textbook via a formal lecture. On the post-assessment both groups were able to recommend more criteria strategies with no obvious differences between the groups (See Table 2).

The groups did differ, however, on the strategy most recommended. On the pre-assessment the most recommended strategy for both groups was the use of a format for taking notes and utilization of visual and verbal clues. On the post-assessment 83% of the SS participants recommended the use of a format for taking notes, an increase of 67%. In contrast, only 23% of the non-participants recommended a format as a lecture learning strategy. Instead, the most commonly recommended strategy for the non-participants was to spend more time listening to the key ideas of the lecture. These differences could be explained, in part, to the emphasis upon the Cornell System for taking lecture notes in the Supportive Seminars.

The data from this question would suggest that both groups profited from a semester of listening to formal lectures and taking notes since they both were able to recommend more criteria strategies for study.

Test preparation strategies. As with the strategies for learning from lectures, the students in both groups had difficulties in August recommending criteria strategies for test preparation. On the post-assessment in December both groups recommended more criteria strategies and less non-

strategies (See Table 2). The SS participants, however, outperformed the non-participants in being able to recommend more strategies to study for a psychology exam. On the pre-assessment only one percent of the SS participants were able to recommend more than one strategy for study, but on the post-assessment, 80% of the subjects were able to recommend criteria strategies. This increase of 79% is substantially more than the increase for the non-participants from five to 29%.

The data from this question would suggest that the SS participants recommended substantially more of a quantity of criteria strategies and more of a balance than the non-participants recommended for the study of a multiple choice and essay psychology exam.

Knowing when you know. When the students in both groups were asked on the pre-assessment to suggest how they would know when they were ready for a test, most could not recommend a criteria strategy. On the post-assessment both groups were able to recommend more criteria strategies, but the SS participants were able to recommend eighteen percent more strategies (See Table 2).

These statistics would tend to suggest that college students lack the ability to check or evaluate their learning, but can be directly taught, to some degree, strategies such as questioning for self-regulation and monitoring.

Final Course Grades

Research question two asked whether there would be a difference in the final grades in Introduction to Psychology for the SS participants and non-participants. The results to this question are reported in Table 3. On a twelve-point scale that the university utilized (A+ = 12, F = 0), the average final grade for the SS participants was 6.76 while the average grade for the non-participants was 4.79, a significant difference favoring the SS participants, $t(139) = 3.54$, $p = .0005$.

Whether these final grades were due to the Supportive Seminar or to different levels of motivation and/or ability cannot be completely established. What can be safely stated is that these 141 students who were initially similar on the study strategy pre-assessment performed differently on the study strategy post-assessment and received highly dissimilar final grades.

Strategy Transfer

The third research question asked whether the participants of the Supportive Seminar were utilizing any of Supportive Seminar strategies in their college courses during the second semester. The data for this question and question four were collected from the questionnaire sent to the 46 SS participants. Twenty-three or one-half of the students responded to the questionnaire (See Table 4).

The students indicated on a Likert Scale (1 - Most of the time, 2 = Occasionally, 3 = Never) their present utilization of the strategies that were taught in the Supportive Seminar during the fall semester. Surveying was the most utilized strategy with 91% of the students indicating that they surveyed (most of the time or occasionally) before they read. Textbook annotation was the second most utilized strategy with 87% of the students indicating that they annotated their textbooks most of the time or occasionally. A distant third was the Cornell lecture note system with 56% of the students indicating an occasional or regular use. Concept cards and mapping were presently being used by only 30% of the students.

These findings basically agreed with another open-ended question that asked the students to list the strategies from the Supportive Seminars that they were still using and to explain why. All of the strategies that students were utilizing or reporting to utilize after five months had one characteristic

in common—they were strategies that could be easily transportable to another contect area. The strategies such as concept cards and mapping may not have been appropriate for the tasks and texts the students were assigned during the second semester. While the questionnaire had a limited return, there were trends that were encouraging to those professionals concerned with strategy transfer.

Student Evaluation of the Supportive Seminar

The fourth research question asked how the Supportive Seminar participants would evaluate the Supportive Seminar concept. On the questionnaire one hundred percent of the students (26) stated that they would recommend the Supportive Seminar to a friend.

Another question asked students to describe the impact (significant, some, none) that the strategies taught in the Supportive Seminar had on their test scores in Introduction to Psychology. Seventy-four percent of the students responded that the strategies had some impact and 26% responded that the study strategies had a significant impact. None of the 23 students indicated that the study strategies had no impact on their test scores.

IMPLICATIONS AND RECOMMENDATIONS

From the data collected the following statements seem defensible:

1. The Supportive Seminar concept can teach college learners how to employ and regulate effective and appropriate study strategies. As measured by the pre and post-study strategy assessment, both groups did increase in their abilities to report appropriate study strategies; however, the SS participants reported more criteria strategies than the non-participants and more strategies that met the specific task demands of a psychology course. The non-participants, on the other hand, tended to recommend generic strategies ("underline your textbook") or strategies that relied heavily upon repetition and memorization.
2. The Supportive Seminar concept can assist college students in learning effective study strategies during the process of learning new content area concepts. This study's finding supports other research evidence that content and process can be effectively integrated without sacrificing either (Martin & Blanc, 1981; Wells, Bean, Yoop, & Mend, 1983-1984). Not only did the SS participants learn the psychology content and the appropriate study strategies, but they also showed a marked tendency, as did the participants in Martin and Blanc's (1981) study, to earn higher grades.
3. The Supportive Seminar concept can assist college students in learning strategies for planning, monitoring, and evaluating their own independent learning. Although the ability to regulate one's comprehension and study is characteristic of mature college students (Smith, 1982), many college students lack this ability with their own learning (Rinehart & Platt, 1984). The data from the study strategy pre-assessment implied that almost all of the 161 subjects had great difficulty recommending how they knew they were ready for a test. However, at the end of the semester on the post-assessment, the SS participants recommended more often than the non-participants the use of self-questioning and paired interrogation sessions, two metacognitive monitoring strategies (Andre & Anderson, 1978-1979; Garner & Alexander, 1982). The emphasis in the Supportive Seminars upon active learning strategies and questioning might explain why the SS participants were more able to recommend strategies that would regulate their own learning.

4. **The Supportive Seminar helps college students learn how to transfer the appropriate study strategies to other tasks and texts.** The impact or transfer effect of study strategy instruction upon a college student's future learning is typically measured in terms of grade point averages and/or final grades (Martin & Blanc, 1981). This study not only attempted to examine the immediate transfer effects (final grades in Introduction to Psychology), but also attempted to describe the long-term transfer effects by asking students to report five months later what strategies they were currently employing in their study and to explain why. While the sample was admittedly limited in size, the SS participants reported that they regularly employed many of the strategies taught in the Supportive Seminar in their second semester courses. Moreover, their reasons for using each strategy demonstrated a strong awareness of the underlying processes and uniquenesses of each strategy.
5. The Supportive Seminar concept has less of a negative image than the traditional skills model and appeals to a wider range of students. College reading professionals seem to be constantly fighting the negative image that students have of their services. Moreover, the students they hope most to serve, never appear unless under administrative or parental duress. Martin and Blanc (1981) found with the Supplemental Instruction model that students did not view their content-based approach as remedial in nature. The 46 participants in this study were also very positive towards the concept and stated that they would highly recommend a Supportive Seminar to a friend or roommate.

Supportive Seminars are credible delivery models that adhere to a content-based philosophy of college reading. Other models exist, but need to be more fully described, qualitatively and quantitatively researched with broad-based questions, and then shared. Once this dissemination occurs, college reading professionals will have more of a legitimate opportunity to instigate the "quality developments in elementary and secondary school practices" that Manzo (1983) has recommended. College reading need not be a clone or illegitimate child; it can be a change-agent with credentials.

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Figure 1. Study strategy assessment used in August and December with 161 subjects in Introduction to Psychology.

Directions:
Read through the entire situation below before you begin to answer the *4 questions.* Please be as thorough and specific as possible with your written answer.

Situation

Imagine that your sister/brother who is a high school junior has asked you for some advice on "how to study" for a particularly difficult college prep psychology class. The teacher lectures, assigns numerous reading assignments in several different texts, and administers six multiple choice and essay exams during the semester. What would you recommend to your brother/sister in regards to:

1. How would you read, understand, and remember the difficult assignments?
2. How would you take notes from the lectures and study these notes?
3. How would you prepare for the examinations?
4. How do you know when you are ready for a test?

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Table 1

Quantity of Criteria Strategies Recommended on Pre-Assessment

Task	Group	% No Strategies	% One Strategy	% Two Strategies	% More than Two Strategies
Textbook Reading	SS participant	40	55	5	—
	non-participant	39	53	7	1
Lecture learning	SS participants	60	39	1	—
	non-participants	58	52	—	—
Test preparation	SS participants	79	20	1	—
	non-participants	75	20	5	—
Knowing when you know	SS participants	86	14	—	—
	non-participants	89	11	—	—

Table 2

Quantity of Criteria Strategies Recommended on Post-Assessment

Task	Group	% No Strategies	% One Strategy	% Two Strategies	% More than Two Strategies
Textbook Reading	SS participant	—	30	37	33
	non-participants	10	62	18	10
Lecture learning	SS participants	1	57	32	10
	non-participants	5	56	36	3
Test preparation	SS participants	—	20	46	34
	non-participants	15	56	28	1
Monitoring	SS participants	10	55	27	8
	non-participants	28	62	10	—

Table 3

Final Grade Distribution for SS Participants and Non-Participants

Grade	No. of SS Participants	No. of Non-participants
A+	3	1
A	2	2
A-	5	6
B+	6	1
B	4	11
B-	5	6
C+	6	10
C	4	19
C-	2	9
D+	3	5
D	3	9
D-	2	3
F	1	13
	N = 46	N = 95

Table 4

SS Participants Use of Strategies Five Months Later

Strategy	Use in Percent: Most of the Time	Occasionally	Never
Surveying	65	26	9
Annotation	52	35	13
Cornell Lecture Note System	38	18	44
Concept Cards	18	12	70
Mapping	14	16	70